## WHAT IS CLAIMED IS:

- 1. Microparticles comprising at least one active agent embedded within a biocompatible, biodegradable polymeric matrix, wherein said microparticles are prepared with an ionic liquid.
- 2. The microparticles according to Claim 1 wherein the ionic liquid has essentially no vapor pressure.
- 3. The microparticles according to Claim 5 wherein the ionic liquid has a vapor pressure of less than about 1 mm/Hg at 25 °C.
- 4. The microparticles according to Claim 1 wherein the ionic liquid is selected from the group consisting of: an imidazolium salt, pyridium salt, ammonium salt, phosphonium salt and sulphonium salt.
- 5. The microparticles according to Claim 1 wherein the ionic liquid is selected from the group consisting of: 1-butyl-3-methylimidazolium hexafluorophosphate, 1-hexyl-3methylimidazolium hexafluorophosphate, 1-octyl-3-methylimidazolium hexafluorophosphate, 1-decyl-3-methylimidazolium hexafluorophosphate, 1-dodecyl-3-methylimidazolium hexafluorophosphate, 1-ethyl-3-methyl-imidazolium-trifluorosulfonate, 1-butyl-3-methylimidazolium-trifluorosulfonate, 1-ethyl-3-methylimidazolium bis((trifluoromethyl)sulphonyl)imidate, 1-hexyl-3-methylimidazolium bis((trifluoromethyl)sulphonyl)amide, 1-ethyl-3-methylimidazolium-trifluoroacetate, 1-butyl-3-methyl-imidazolium-trifluoroacetate, 1-ethyl-3-methylimidazolium-tetrafluoroborate, 1-hexylpyridinium tetrafluoroborate, 1-octylpyridinium tetrafluoroborate, 1-butyl-3-methylimidazolium tetrafluoroborate, 1-methy-3-ethyl imidazolium chloride, 1-ethyl-3-butyl imidazolium chloride, 1-methy-3-butyl imidazolium chloride, 1-methy-3-butyl imidazolium bromide, 1-octyl-3-methyl-imidazolium-bromide, 1-methy-3-propyl imidazolium chloride, 1-methy-3-hexyl imidazolium chloride, 1-methy-3-octyl imidazolium chloride, 1-methy-3-decyl imidazolium chloride, 1-methy-3-dodecyl imidazolium chloride, 1methy-3-hexadecyl imidazolium chloride, 1-methy-3-octadecyl imidazolium chloride, 1methy-3-octadecyl imidazolium chloride, ethyl pyridinium bromide, ethyl pyridinium chloride, ethylene pyridinium dibromide, ethylene pyridinium dichloride, butyl pyridinium chloride, benzyl pyridinium bromide, and mixtures thereof.

- 6. The microparticles according to Claim 1 wherein the polymer is a co-polymer of poly(glycolic acid) and poly(D,L-lactic acid).
- 7. The microparticles according to Claim 1 wherein the active agent is selected from the group consisting of a peptide, protein, hormone, analgesic, anti-migraine agent, anti-coagulant agent, narcotic antagonist, chelating agent, anti-anginal agent, chemotherapy agent, sedative, anti-neoplastic, prostaglandin and antidiuretic agent, cerebral stimulant, pain management agent, antalkaloid, cardiovascular drug and agent for treating rheumatic condition.
- 8. The microparticles according to Claim 7 wherein the peptide or protein is selected from the group consisting of insulin, calcitonin, calcitonin gene-regulating protein, parathyroid hormone, GLP-1, atrial natriuretic protein, colony-stimulating factor, GM-CSF, betaseron, erythropoietin, α-interferon, β-interferon, γ-interferon, human growth hormone, octreotide, somatropin, somatotropin, somastostatin, somatomedins, luteinizing hormone releasing hormone, tissue plasminogen activator, growth hormone releasing hormone, oxytocin, estradiol, growth hormones, leuprolide acetate, factor VIII, interleukin-2, interleukin-3, interleukin-14, and analogues and antagonists thereof.
- 9. Microparticles comprising at least one active agent embedded within a biocompatible, biodegradable polymeric matrix, and at least one ionic liquid.
- 10. A method for preparing microparticles comprising (i) dissolving or dispersing an active agent in a biocompatible, biodegradable polymer; (ii) dissolving the polymer containing the active agent in an ionic liquid; and (iii) removing the ionic liquid to form microparticles.
- 11. A method for preparing microparticles comprising (i)' dissolving or dispersing an active agent in an ionic liquid; (ii)' dissolving the ionic liquid containing the active agent in a biocompatible, biodegradable polymer; and (iii)' removing the ionic liquid to form microparticles.
- 12. A method for preparing microparticles comprising (i)" dissolving or dispersing an active agent in a biocompatible, biodegradable polymer and an ionic liquid to form a mixture; (ii)" adding a solvent and at least one surfactant to the mixture; and (iii)" removing the ionic liquid to form microparticles.

- A method for preparing microparticles comprising (i)" dissolving or dispersing a biodegradable polymer in an ionic liquid; (ii)" emulsification of the resulting solution in a lipophilic phase; (iii)" adding a solution of an active agent to the emulsion to form microparticles, and (iv)" removing the ionic liquid.
- 14 The method according to Claim 12 wherein the surfactant is selected from the group consisting of a reaction products of a natural or hydrogenated castor oil and ethylene oxide, polyoxyethylene-sorbitan-fatty acid esters, polyoxyethylene fatty acid esters, polyoxyethylene-polyoxypropylene co-polymers and block co-polymers, dioctylsulfosuccinate or di-[2-ethylhexyl]-succinate, phospholipids, propylene glycol mono- and di-fatty acid esters, polyoxyethylene alkyl ethers, tocopherol esters, and docusate salts and combinations thereof.
- 15. The method according to Claim 12 wherein the solvent is selected from the group consisting of an alkyl acetate, lower alkyl alcohol, aliphatic  $C_{6-12}$  hydrocarbon, aromatic hydrocarbon, dialkyl ketone, dialkyl ether, and combinations thereof.
- 16. The method according to claim 13 wherein the lipophilic phase is selected from the group consisting of liquid paraffins, silicon oils, mixtures of middle-chain triglycerides, oleic acid oleoyl esters and combinations thereof.